BB&E
CONSULTING ENGINEERS & PROFESSIONALS

April 5, 2019

Mr. Mark Doolan
U.S. Environmental Protection Agency
Air and Waste Management Division, WRAP
Branch11201 Renner Boulevard
Lenexa, KS 66219

Subject: Collis, Inc. (EPA ID No. IAD047303771)
Clinton, Iowa
Corrective Measures Implementation – Long Term Monitoring Groundwater Monitoring Work Plan - Revised Final

Dear Mr. Doolan,

On behalf of Collis, Inc., BB&E, Inc. is pleased to submit a hardcopy of the *Revised Final - CMI - LTM Groundwater Monitoring Work Plan.* This Revised LTM Work Plan has been updated as a result of well abandonment activities conducted February 25-27, 2019. As agreed upon during the October 24, 2018 meeting at Region 7 between the United States Environmental Protection Agency (USEPA) and Collis, all but thirteen (13) of the 44 wells at and in the vicinity of the Collis site, were properly abandoned to minimize long-term environmental liabilities. The 13 wells sampled as part of LTM activities remain in place.

If you have any questions concerning this document, or any other issues regarding this project, please call me at (248) 489-9636, Extension 317.

Sincerely,

Cindy Lang
Project Manager

RCRA 04/05/2019
585310

Cc: Brian Calhoun, SSW Holding Company, Inc.

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AWMD/WRAP IO

Doolan, Mark

From: Doolan, Mark
Sent: Wednesday, May 08, 2019 2:58 PM
To: Cindy Lang
Subject: RE: Collis LTM event & revised workplan

Cindy: I have received and reviewed the LTM Groundwater Monitoring Work Plan. I have no comments and am hereby approving the report.

D. Mark Doolan
U.S. Environmental Protection Agency
Land, Chemical, & Redevelopment Division, ROAG Branch
11201 Renner Blvd.
Lenexa, KS 66219
913-551-7169

From: Cindy Lang <clang@bbande.com>
Sent: Friday, April 05, 2019 10:56 AM
To: Doolan, Mark <Doolan.Mark@epa.gov>
Cc: Brian Calhoun <bcalhoun@sswholding.net>
Subject: RE: Collis LTM event & revised workplan

Hi Mark,

I realized the revised LTM workplan still listed Andrea as the contact. I updated the electronic copy and have attached it here. A hardcopy will be mailed later today.

Have a great weekend!
Cindy

From: Cindy Lang
Sent: Monday, April 1, 2019 5:08 PM
To: Doolan, Mark <Doolan.Mark@epa.gov>
Cc: Brian Calhoun <bcalhoun@sswholding.net>
Subject: Collis LTM event & revised workplan

Good Afternoon, Mark,

I hope you are doing well. I wanted to let you know we plan to conduct the 1st half 2019 semi-annual LTM event for Collis next week (April 8 - 10). Also we have updated the LTM Work Plan to reflect the well abandonment activities. There were minor text changes to the report. The majority of the updates were to Tables 1 and 2 and Figure 1 to reflect the 31 piezometers and monitoring wells that were abandoned in February. These were removed from the tables and figure. I have attached a pdf of the revised work plan as well as a redlined copy of the text portion so you can see the changes to the text. Please let Brian or I know if you have any questions.

Additionally, we received the well abandonment reports today from the drilling company. We will have a draft well abandonment report to you in a couple of days.

BB&E
CONSULTING ENGINEERS & PROFESSIONALS

Collis, Inc. – Corrective Measures Study
REVISED FINAL CMI - LTM Groundwater Monitoring Work Plan

Report Date: April 1, 2019

D. Mark Doolan
U.S. Environmental Protection Agency
Air and Waste Management Division, WRAP Branch
11201 Renner Boulevard
Lenexa, KS 66219

Site Name: Collis, Inc.
Clinton, Iowa
Long Term Monitoring
U.S. EPA ID #IAD047303771

Prepared by: Cindy Lang, BB&E, INC.

BB&E, INC (BB&E) is pleased to provide this Revised Corrective Measures Implementation (CMI) – Long Term Groundwater Monitoring Work Plan (LTM WP). The Corrective Measures Study Report, dated April 24, 2018, included recommendations for LTM groundwater monitoring including semi-annual groundwater monitoring for five years. Following the five years of semi-annual sampling, an evaluation will be conducted to determine the effectiveness of the selected monitored natural attenuation (MNA) groundwater remedy. The evaluation results, with recommendations, will be submitted to EPA for review, modifications to the semi-annual schedule, and/or approval. The semi-annual LTM sampling and analysis will be conducted in accordance with the approved Quality Assurance Project Plan (QAPP) (BB&E, September 2016).

This Revised LTM WP has been updated as a result of well abandonment activities conducted February 25-27, 2019. In accordance with the EPA approved *Work Plan for 2019 Monitoring Well Abandonment Activities* dated February 14, 2019, all but thirteen (13) of the 44 wells and piezometers that were no longer utilized and, as agreed upon during the October 24, 2018 meeting at Region 7 between the United States Environmental Protection Agency (USEPA) and Collis, were properly abandoned to minimize long-term environmental liabilities. The 13 wells sampled as part of LTM activities remain in place.

LTM GROUNDWATER AND STAFF GAUGE ELEVATIONS

During each semi-annual LTM groundwater monitoring event, continued collection of static water level measurements from the remaining piezometers and monitoring wells will occur. Static water levels will continue to be collected from the thirteen (13) monitoring wells/piezometers listed in Table 1 as well as any newly installed monitoring wells (if necessary). Further monitoring of the staff gauges will not be completed in accordance with a conference call held on February 5, 2015, between U.S. EPA and Collis, when it was determined that continued monitoring of the staff gauges is no longer necessary. Although surface water elevations will not be collected, the surface water elevation relevant to site groundwater elevations will be evaluated by measurement of

chloride	• provides evidence of dechlorination, • serves as a possible use in mass balancing • may also serve as a conservative tracer
nitrate/nitrite	• nitrate compounds are used as an electron acceptor by denitrifying bacteria or is converted to ammonia for assimilation • nitrite is produced from nitrate under anaerobic conditions
sulfate/sulfide	• changes in the sulfate concentration may provide evidence of activities of sulfate reducing bacteria • sulfide may provide evidence of a sulfate reduction.
dissolved iron	• iron in ferrous (soluble reduced) form indicates activity of iron reducing bacteria • iron in ferric (oxidized) form is used as an electron acceptor
dissolved manganese	• manganese is an indicator of iron and manganese reducing conditions
methane, ethane, and ethene	• provide evidence of complete dechlorination of chlorinated methanes, ethanes, and ethenes • methane also indicates activity of methanogenic bacteria

As shown on Table 1, the well targeted in the second saturated unit is MW-34 due to previous chlorinated volatile organic compound (CVOC) detections; and in the third saturated unit, MW-42 and MW-53 due to previous CVOC detections.

1,4-Dioxane Sampling

Monitoring wells MW-34, MW-42, MW-45, and MW-53 will be sampled and analyzed for 1,4-Dioxane on a semi-annual basis for five years. Laboratory analyses will be conducted per EPA Method 8260B SIM.

Field Parameters

Field parameters, including oxygen reduction potential, dissolved oxygen, specific conductivity, and pH, will be collected from all wells sampled during the CMI - LTM Groundwater Monitoring semi-annual events to determine when to sample a well and enhance the dataset for evaluation of MNA effectiveness in accordance with the ITRC Technical Regulatory Guidelines Natural Attenuation of Chlorinated Solvents in Groundwater: Principles and Practices (September 1999). These parameters will be recorded on groundwater sampling field forms.

Decontamination

The approved QAPP describes the decontamination process using Alconox or other phosphate free detergent. Dedicated sampling materials will be used as much as possible to reduce the need for

During the review of this Revised CMI - LTM WP, should you have any questions or comments, I would be happy to answer them. Please do not hesitate to contact me at (248) 489-9636 ext. 317.

Sincerely,

Cindy Lang
Project Manager
BB&E, INC

cc: Mr. Brian Calhoun – Collis/SSW
Mr. Charlie Denton – Barnes & Thornburg, LLP

Enclosed:

Figure 1 – LTM Monitoring Well Locations
Table 1 – LTM Groundwater Monitoring Program
Table 2 – Monitoring Well Construction Detail

File Path: H:\jobs\SSW\Collis, IA\02028018 - LTM WP\REVISED FINAL\BC comments\Revised FINAL - LTM WP_redlined version.docx
Date: 4/1/2019 4:52:27 PM
Author/Reviewer: KVB/TEB/CML

FIGURES

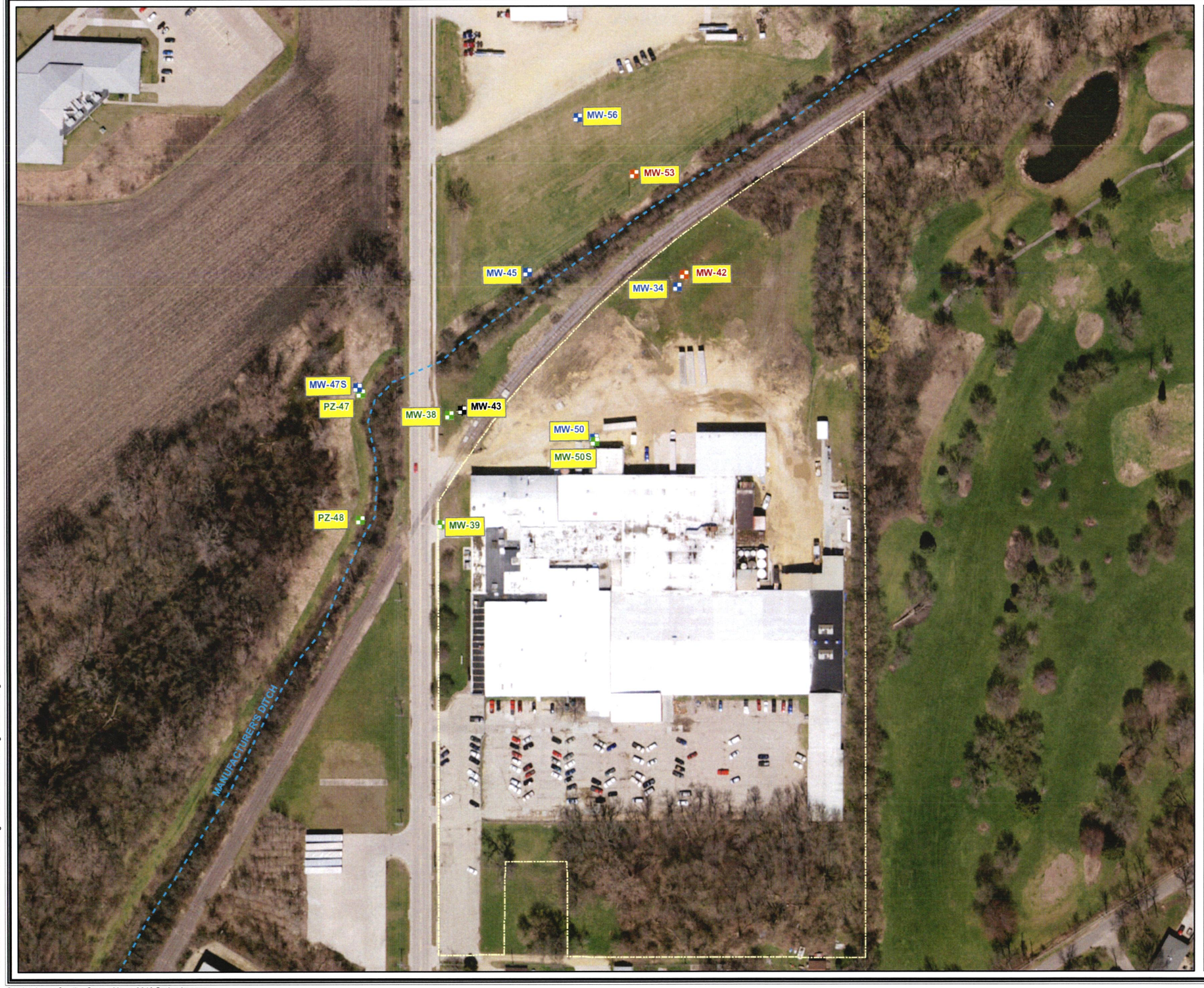

Figure 1

LTM Monitoring Well Locations

Collis, Inc. Manufacturing Facility
Clinton, Iowa

Legend:

- Staff Gauge Location
- Manufacturer's Ditch
- Property Boundary (Approximate)

Monitoring Wells

- First Saturated Unit
- Second Saturated Unit
- Third Saturated Unit
- Fourth Saturated Unit
- LTM Monitoring Well

Note:
LTM = long term monitoring

NORTH

0 250 500

Feet

BB&E

Document Path: H:\IT\GIS\SS\WC\collis\figures\LTM GW Monitoring Work Plan\Figure 2 - Site Features.mxd

Service Layer Credits: State of Iowa 2016 Spring Imagery
KVB 3/13/2019

TABLES

Table 1
LTM Groundwater Monitoring Program
LTM Groundwater Monitoring
SSW Collis, Clinton Iowa

First Saturated Groundwater Unit[1]								
	First Semi-Annual Sampling Event				Second Semi-Annual Sampling Event			
Well	SWL	VOCs	MNA	1,4-Dioxane	SWL	VOCs	MNA	1,4-Dioxane
MW-38	X	X			X	X		
MW-39	X	X			X	X		
MW-50S	X	X			X	X		
PZ-47	X	X			X	X		
PZ-48	X	X			X	X		

Second Saturated Groundwater Unit[2]								
	First Semi-Annual Sampling Event				Second Semi-Annual Sampling Event			
Well	SWL	VOCs	MNA[5]	1,4-Dioxane	SWL	VOCs	MNA[5]	1,4-Dioxane
MW-34	X	X	X	X	X	X	X	X
MW-45	X	X		X	X	X		X
MW-47S	X	X			X	X		
MW-50	X	X			X	X		
MW-56	X	X			X	X		

Third Saturated Groundwater Unit[3]								
	First Semi-Annual Sampling Event				Second Semi-Annual Sampling Event			
Well	SWL	VOCs	MNA[5]	1,4-Dioxane	SWL	VOCs	MNA[5]	1,4-Dioxane
MW-42	X	X	X	X	X	X	X	X
MW-53	X	X	X	X	X	X	X	X

Fourth Saturated Groundwater Unit[4]								
	First Semi-Annual Sampling Event				Second Semi-Annual Sampling Event			
Well	SWL	VOCs	MNA	1,4-Dioxane	SWL	VOCs	MNA	1,4-Dioxane
MW-43	X	X			X	X		

Notes:

CMI = Corrective Measures Implementation

LTM = Long Term Monitoring

MW = Monitoring Well

SWL = Static Water Level

VOC = Volatile Organic Compound

All USEPA test methods are detailed in the approved QAPP (BB&E, September 2016)

Field parameters (ORP, DO, conductivity, and pH) will be collected from all wells sampled during the semi-annual events

Sampling will be conducted for 5 consecutive years.

[1] First Saturated Unit is comprised of surficial soils

[2] Second Saturated Unit is comprised of upper consolidated sediments and weathered bedrock

[3] Third Saturated Unit is comprised of lower consolidated sediments and upper bedrock

[4] Fourth Saturated Unit is comprised of bedrock

[5] MNA (Monitored Natural Attenuation) Parameters include: chloride, nitrate/nitrite, sulfate/sulfide, dissolved iron, dissolved manganese, methane, ethane, and ethene.

TABLE 2
MONITORING WELL CONSTRUCTION DETAILS
LTM GROUNDWATER MONITORING
COLLIS, INC., CLINTON, IOWA

Well ID	TOC ELEVATION (ft amsl)	Constructed Well Depth (ft bgs)	Nominal Screen Interval (ft bgs)
MW-34	589.29	31.6	25-30
MW-38	585.47	9.95	5-10
MW-39	587.47	13.91	9-14
MW-42	589.25	50.2	42-47
MW-43*	585.21	99.38	94.75-99.75
MW-45*	582.41	25.59	19-24
MW-47S*	583.17	17.93	13-18
MW-50	587.27	24.77	20-25
MW-50S	587.51	12.28	7.5-12.5
MW-53*	582.73	52.24	45-50
MW-56	582.33	30	25-30
PZ-47	583.17	10.89	1-11
PZ-48	584.27	10.65	1-11

Notes:

* Artesian conditions identified

NA - Not available

DTW - Depth to water

TOC - Top of casing

ft bgs - feet below ground surface

ft amsl - feet above mean sea level